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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/029,533	12/20/2001	Gaetano Santoruvo	01-RB-075 (850063.587)	5875

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STMICROELECTRONICS, INC.
MAIL STATION 2346
1310 ELECTRONICS DRIVE
CARROLLTON, TX 75006

EXAMINER

FASTOVSKY, LEONID M

ART UNIT	PAPER NUMBER
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3742

DATE MAILED: 03/19/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/029,533

Applicant(s)

SANTORUVO ET AL.

Examiner

Leonid M Fastovsky

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4-8,10-19,21-49 is/are pending in the application.
- 4a) Of the above claim(s) 5-15,17-19,21-23,27,31-33 and 36-41 is/are withdrawn from consideration.
- 5) ☒ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1,4,16,24-26,28-30,34,35 and 42-49 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Claims 5-9, 11-15, 17-19, 21-23, 27, 31-33 and 36-41 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 6. Claims 5 is also withdrawn from further consideration because it depends on non-elected claim 41, claims 21-22 read on non-elected species (Fig. 6), and a thermal barrier in claims 23 and 27 is shown in Figure 5. In contrast, Applicant selected species in Figures 1 and 2 in the response, which do not appear to include this element.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 4 and 16 are rejected under 35 U.S.C. 103(a) over Cozad (6,160,2430) in view of Sosnowski et al (2003/0190632).

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Cozad teaches an integrated heater 50, comprising a semiconductor material 52, at least one transistor 92 formed on the semiconductor material 52, a dielectric layer 58, a fluid (Col. 4, line 49) retaining chamber (Fig. 6) showing chamber where 63 fills integral with semiconductor material 52, and fluid 63 to be heated is positioned within the retaining chamber 61. Cozad teaches also a wall portion of semiconductor and body 58 with wall portion adjacent to and in sealing arrangement with semiconductor wall portion, such that wall portions together define a fluid chamber. However, Cozad does not teach a transistor formed in the semiconductor material. Sosnowski discloses transistors and semiconductor elements incorporated directly the silicon (Page 13, paragraph 164). It would have been obvious to one having ordinary skill in the art to modify Cozad invention to form at least one transistor in the semiconductor material to reduce complexity of the circuitry as taught by Sosnowski.

4. Claims 24-26, 28-30, 34-35, 42-45, 47 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cozad in view of Sosnowski and further in view Williams (5,243,212) and Jang et al (6,624,065).

Cozad in view of Sosnowski teaches substantially the claimed invention comprising an integrated heater 50 comprising a semiconductor material 52, at least one transistor 92 formed in the semiconductor material 52 of Sosnowski (Page 13, paragraph 164), a fluid retaining chamber 61 (Fig. 4) integral with semiconductor material 52, and fluid 63 to be heated positioned within the fluid retaining chamber 61.

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However Cozad in view of Sosnowski does not teach a source region, a drain region, a channel region and a gate electrode being metal. Williams teaches a semiconductive transistor device comprising a semiconductor region, a source region, a drain region, a channel region and a gate electrode made out of polycrystalline silicon (Col. 6, line 51) on a dielectric layer 208 disposed on the channel region (Claim 1). Jang discloses a metal gate electrode 20. It would have been obvious to one having ordinary skill in the art to modify the invention of Cozad in view of Sosnowski to include a transistor having a source region, a drain region, a dielectric layer, a channel region within the semiconductor material and a gate electrode made out of metal as taught by Jang in order to prevent an electric short circuit (Col. 1, lines 8-13) and disposed on the dielectric layer to control the conductivity of the induced inversion region by the concentration of the ionic charge present in the dielectric layer as taught by Williams (Abstract).

5. Claims 46 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cozad in view of Sosnowski, Williams and further in view of Ma (6,270,192). Cozad in view of Sosnowski teaches substantially the claimed invention, but does not teach an electrically insulating layer between the semiconductor material and the chamber. Ma teaches such a layer (Claim 1). It would have been obvious to one having ordinary skill in the art to modify the insulating layer 58 of Cozad to include an electrically insulating layer positioned between the heater within a semiconductor (as taught by Sosnowski) and the chamber to define a heated chamber which does not impede the flow of fluids in the chamber as taught by Ma (Col. 3, lines 20-29).

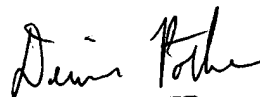
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonid M Fastovsky whose telephone number is 703-306-5482. The examiner can normally be reached on M-Th. 8.00 am -6.00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Denise Pothier can be reached on 703-308-0265. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Leonid M Fastovsky
Examiner
Art Unit 3742

lmf


DENISE POTHIER
PRIMARY EXAMINER